LISTING OF THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Claim 1 (Currently Amended)

A synchronous rectifier comprising:

a MOSFET device; and

a gate driver for driving ~~the gate of~~ the MOSFET device, the MOSFET device comprising first and second MOSFET transistors coupled with their drain-source paths in parallel to receive an alternating current waveform for rectification by the drain- source paths of the MOSFET transistors, the gate driver being connected to the respective gates of the first and second MOSFET transistors, the first transistor having a low Rdson and the second transistor having a high Rdson whereby the apparent Rdson of the MOSFET device is increased when the current through the MOSFET device is below a threshold thereby enabling zero crossing detection.

Claim 2 (Currently Amended)

The synchronous rectifier of claim 1, wherein the gate driver comprises a Schmidt trigger having an output coupled to one of the gates of the ~~gate of a~~ MOSFET device and having its inputs coupled across the drain-source path of the corresponding MOSFET.

Claim 3 (Currently Amended)

The synchronous rectifier of claim 2, wherein the gate driver ~~Schmidt trigger~~ comprises two Schmidt triggers, one connected to the gate of ~~for~~ the first transistor having a low Rdson and a second connected to the gate of ~~for~~ the second transistor having a high Rdson.

Claim 4 (Currently Amended)

The synchronous rectifier of claim 3 ~~2~~, wherein each said the Schmidt trigger has its inputs coupled across the drain-source voltage of the corresponding MOSFET device.

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Claim 5 (Currently Amended)

A synchronous rectifier comprising a power MOS device having a drain, a source and a gate, and an amplifier driving the gate of the power MOS device, the amplifier having a positive input coupled to the source of the power MOS device and a negative input coupled to ~~a reference voltage coupled between the negative input and~~ the drain of the power MOS device, and a reference voltage coupled to one of said inputs, whereby when the drain-source voltage across the MOS device is near the reference voltage, the amplifier maintains the drain-source voltage at the reference voltage until the gate-source voltage equals approximately zero, thereby enabling zero current detection ~~by an offset comparator~~.

Claim 6 (Currently Amended)

A method of driving a MOSFET device as a synchronous rectifier comprising:

increasing the apparent drain to source on-resistance (Rdson) of the MOSFET device when the current flowing in the drain-source path of the MOSFET device is below a threshold level, thereby enabling zero crossing detection.

Claim 7 (Currently Amended)

The method of claim 6, further comprising providing, as said MOSFET device, two ~~MOSFETS~~ MOSFETs with their drain-source paths in parallel, one MOSFET having a high Rdson and the second having a low Rdson.

Claim 8 (Currently Amended)

The method of claim 7, further comprising sensing the voltage across the drain-source path of the MOSFET device and switching on the MOSFET with the high Rdson first and as the current increases above an on-threshold level, switching on the MOSFET with the low Rdson.

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Claim 9 (Original)

The method of claim 8, further comprising switching the MOSFET with low Rdson off as the current decreases below an off-threshold level and thereafter switching the MOSFET with high Rdson off as the current further decreases.

Claim 10 (Original)

The method of claim 9, wherein the on-threshold and off-threshold levels are different.

Claim 11 (Original)

The method of claim 6, wherein the apparent drain-source on-resistance is increased at a current level below the threshold level by providing an offset voltage to maintain the drain-source voltage substantially constant until the gate-source voltage is approximately zero.

Claim 12 (Currently Amended)

A method for driving a power MOSFETs as a synchronous rectifier comprising the steps of:

coupling first and second MOSFETs ~~devices~~ with their drain-source paths in parallel to receive an alternating current waveform for rectification by the drain-source paths, the first MOSFET having a low Rdson and the second MOSFET having a high Rdson whereby the apparent Rdson of the two MOSFETs in parallel is increased when the current through the MOSFETs is below a threshold thereby enabling zero crossing detection.

Claim 13 (Currently Amended)

The method of claim 12 further comprising the step of coupling the inputs of a Schmidt trigger across the drain-source path and the ~~having an~~ output ~~coupled~~ to the gate of ~~the~~ one said MOSFET and sensing the drain-source voltage across the MOSFET to determine when to switch the first and second MOSFETs on and off.

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Claim 14 (Currently Amended)

The method of claim ~~13~~ 12, further comprising the step of providing two Schmidt triggers, one ~~for~~ having an output connected to the gate of the first MOSFET having a low Rdson and a second ~~for~~ having an output connected to the gate of the second MOSFET having a high Rdson.

Claim 15 (Currently Amended)

A method for driving a synchronous rectifier comprising a power MOS device having a gate, a drain and a source, comprising providing an amplifier driving the gate of the power MOS device, the amplifier having a positive input coupled to the source of the power MOS device and a negative input coupled to ~~a reference voltage coupled between the negative input and~~ the drain of the power MOS device, and a reference voltage coupled to one of said inputs and, when the drain-source voltage across the MOS device is near the reference voltage, maintaining the drain-source voltage at the reference voltage until the gate-source voltage equals approximately zero, thereby enabling zero current detection ~~by an offset comparator~~.

Claim 16 (Currently Amended)

A synchronous rectifier, comprising:

a MOSFET device for providing a rectifying operation;

a negative feedback signal coupled to ~~at least one of~~ a drain ~~and a source~~ of the MOSFET device;

a positive feedback signal coupled to a source of the MOSFET device;

a control circuit coupled to the feedback signals and operable to provide a gate control signal;

the gate control signal being applied to a gate of the MOSFET device and operable to maintain the rectifying operation; and

a reference voltage coupled to the control circuit for contributing to a closed loop control having linear gain whereby the MOSFET device emulates an ideal diode.

Claim 17 (Currently Amended)

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A synchronous rectifier, comprising:

a MOSFET device for providing a rectifying operation;

a negative feedback signal coupled to ~~at least one of~~ a drain ~~and a source~~ of the MOSFET device;

a positive feedback signal coupled to a source of the MOSFET device;

a control circuit coupled to the feedback signals and operable to provide a gate control signal;

the gate control signal being applied to a gate of the MOSFET device and operable to maintain the rectifying operation; and

a reference voltage coupled to the control circuit for contributing to a closed loop control whereby the MOSFET device emulates an ideal diode;

wherein the control circuit and the reference voltage are incorporated into a common component with the MOSFET device.

Claim 18 (canceled)

Claim 19 (Currently Amended)

A method for controlling a MOSFET Vds voltage, comprising:

obtaining a voltage reference for contributing to a control signal provided to a MOSFET;

operating a closed loop control in conjunction with the voltage reference to provide the control signal to the MOSFET;

providing a negative feedback to the closed loop control from the ~~based on a~~ MOSFET drain and a positive feedback from the MOSFET source ~~parameter~~, whereby the Vds voltage of the MOSFET is controlled to emulate an ideal diode; and

providing a linear gain in the closed loop control.

Claim 20 (Currently Amended)

A method for controlling a MOSFET Vds voltage, comprising:

obtaining a voltage reference for contributing to a control signal provided to a MOSFET;

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operating a closed loop control in conjunction with the voltage reference to provide the control signal to the MOSFET;

providing a negative feedback to the closed loop control from the MOSFET drain and a positive feedback from the MOSFET source ~~based on a MOSFET parameter;~~

whereby the Vds voltage of the MOSFET is controlled to emulate an ideal diode~~; and~~ with reduced ~~reducing a~~ MOSFET sensitivity related to variations in Vds voltage thresholds.

Claim 21 (Currently Amended)

A synchronous rectifier, comprising:

a MOSFET device for providing a rectifying operation;

a negative feedback signal coupled to ~~at least one of~~ a drain ~~and a source~~ of the MOSFET device;

a positive feedback signal coupled to a source of the MOSFET device;

a control circuit coupled to the feedback signal and operable to provide a gate control signal;

the gate control signal being applied to a gate of the MOSFET device and operable to maintain the rectifying operation; and

a reference voltage coupled to the control circuit for contributing to a closed loop control

whereby the MOSFET device emulates an ideal diode and has a reduced sensitivity related to variations in Vds voltage thresholds.

Claim 22 (Currently Amended)

The synchronous rectifier of claim 29 ~~5~~, wherein said reference voltage has a positive terminal at said negative input of the amplifier.

Claim 23 (Currently Amended)

The method of claim 30 ~~15~~, wherein said reference voltage has a positive terminal at said negative input of the amplifier.

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Claim 24 (New)

The synchronous rectifier of claim 2, wherein said Schmidt trigger has a negative input connected to the drain of the MOSFET and a positive input connected to the source of the MOSFET.

Claim 25 (New)

The synchronous rectifier of claim 4, wherein each said Schmidt trigger has a negative input connected to the drain of the corresponding MOSFET and a positive input connected to the source of the corresponding MOSFET.

Claim 26 (New)

The method of claim 13, wherein said Schmidt trigger has a negative input connected to the drain of the MOSFET and a positive input connected to the source of the MOSFET.

Claim 27 (New)

The method of claim 14, wherein the inputs of each Schmidt trigger are coupled across the drain-source path of the corresponding MOSFET.

Claim 28 (New)

The method of claim 27, wherein said Schmidt trigger has a negative input connected to the drain of the MOSFET and a positive input connected to the source of the MOSFET.

Claim 29 (New)

The synchronous rectifier of claim 5, wherein said reference voltage is coupled between the negative input and the drain of the power MOS device.

Claim 30 (New)

The method of claim 15, wherein said reference voltage is coupled between the negative input and the drain of the power MOS device.

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